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(54) Title: RESTRICTING FLUID PASSAGE AND NOVEL MATERIALS THEREFOR

(57) Abstract: Water problems in the production of oil or gas from subterranean formations is addressed by providing a method of restricting passage of a fluid from a first location to a second location in a subterranean formation by injecting into the formation a formulation comprising a first material, for example a dialdehyde, arranged to cross-link a second polymeric material, for example a polyvinyl alcohol, thereby to form a polymeric material of high viscosity which may block the passage between the first and second locations.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2004/001126

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E21B33/138

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 939 203 A (MARROCCO) 3 July 1990 (1990-07-03) column 7, line 45 - line 68 column 8, line 34 - line 43 column 10, line 58 - line 67 abstract	1-7,16, 18-20, 23-25, 31,32
X	US 5 335 733 A (DOVAN HOAI T ET AL) 9 August 1994 (1994-08-09) the whole document	1-7,31
A	US 6 103 772 A (SYDANSK ROBERT D) 15 August 2000 (2000-08-15) the whole document	1,31
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

6 August 2004

Date of mailing of the international search report

26.11.2004

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB2004/001126

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A.	EP 0 577 010 A (PHILLIPS PETROLEUM CO) 5 January 1994 (1994-01-05) claims -----	1,31

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2004/001126

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1- 26, 28- 30 (in part) , 31- 34

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-26,28-30 (in part), 31-34

method of restricting passage of fluid from first location to a second location and method of plugging utilising a composition comprising a first material and a second polymeric material or a third polymeric material (obtained by reacting the first material and the second polymeric material), subterranean formation comprising a third polymeric material 1 and restrictor formulation comprising a first material and a second polymeric material.

2. claims: 27,28-30 (in part)

method of reducing the production of water from an oil-producing subterranean formation utilising a restrictor formulation characterized in terms of its density.

3. claims: 35-37

method of forming a polymeric material by encapsulating in a polymeric material droplets of a strength adjustment means.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB2004/001126

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